

A3 cont'd
16.(New) A ball ramp actuator according to claim 11 wherein the grooves include at least one spherical recess to provide a detent for maintaining the ball in a locked or unlocked position.

REMARKS

The examiner objected to the drawings, indicating that the drawings do not show the second cam plate rotatable with respect to the first cam plate. Applicants respectfully submit that new Fig. 3b, in conjunction with Fig. 3a, show the relative rotation between the first and second cam plates. No new matter is included, as this feature is described in the original specification at page 3, line 20 to page 4, line 3 and in original claim 1. Applicants respectfully request that Fig. 3 be renumbered to "Fig. 3a" as indicated in red on the enclosed drawing sheet and that new Fig. 3b submitted herewith be entered. A separate letter, copy enclosed, is being sent to the draftsman pursuant to M.P.E.P. §608.02(r).

The examiner rejected claims 1-4, 7, 8 and 10 under 35 U.S.C. §112, first paragraph, indicating that "it is not shown how the second cam plate is rotatable with respect to the first cam plate." Applicants respectfully submit that numerous ways of moving one cam plate relative to another cam plate are known in the art, for example, as illustrated in U.S. patents Nos. 6,082,504; 3,991,859; 5,528,950; and 5,910,061 identified in the original specification on page 1, line 9, and that one skilled in the art would be able to practice the invention based on the description set forth in the specification.

The examiner rejected each of the pending claims as being anticipated by U.S. Patent No. 5,088,767 (Hoblingre et al.) or as obvious in view of Hoblingre et al. in combination with U.S.

Patent No. 4,357,810 (Kumpar) or U.S. Patent No. 5,713,445 (Davis et al.). Applicants respectfully traverse these rejections.

Independent claim 11 recites first and second opposed cam plates that rotate relative to one another. The first cam plate includes “at least one groove providing a non-circumferential ball ramp, the first cam plate groove being positioned progressively more radially outward as the groove extends clockwise about the cam plate.” The second cam plate includes “at least one groove providing a non-circumferential ball ramp, the second cam plate groove being positioned progressively more radially outward as the groove extends counterclockwise about the cam plate; the ball ramp of the second cam plate intersecting with the ball ramp of the first cam plate when viewed axially.” The opposed orientation of the ramps causes the ramps to criss-cross one another as illustrated in Figs. 3a and 3b, thereby defining confined positions for the ball, both in the locked and unlocked positions.

In contradistinction, Hoblingre et al. teaches two cam plates that are fixed in rotational relation to one another. The cam plates are defined by 1) the widened head 42 of the tie bolt and 2) the washer 24. The washer 24 has a central hole that “matches the shape of the tie bolt and ensures that the later is integral in rotation and in pivoting with the washer” Hoblingre et al. at col. 3, lines 20-22. The washer 24 rotates with the tie bolt and thereby the opposed integral head 42.

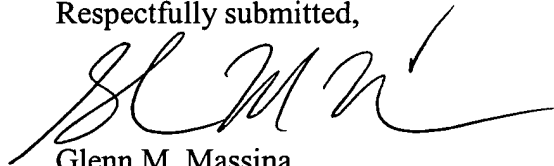
Furthermore, the ramps of the opposed cam plates do not have opposite configurations. Tracks 44 and 46 each extend radially outwardly from center of the washer or head to the peripheral rim thereof as shown in Figs. 5-7. The tracks 44 and 46 directly overlap one another to define radial paths as explained at col. 4, lines 26-28 – “the radial rolling track or tracks 44

and/or 46, which are fixed in rotation, limit this displacement to a radial travel.” The remaining cited references fail to teach or suggest the shortcomings of Hoblingre et al.

Hoblingre et al., alone or in any reasonable combination, fails to teach or suggest each and every limitation of the claimed invention. It is respectfully submitted that pending claims 11-16 are in condition for allowance. Early reconsideration and allowance of the pending claims are respectfully requested.

If the examiner believes an interview, either telephonic or in person, will advance the prosecution of this matter, it is respectfully submitted that the examiner get in contact with the undersigned.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'G M Massina', with a long horizontal flourish extending to the right.

Glenn M. Massina
Reg. No. 40,081

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Version With Markings to Show Changes Made

In the specification

The paragraph beginning on page 3, line 1 is amended as indicated below.

--Figs. 3a and 3b are [is an] axial views of a ball ramp actuator, with internal ball tracks indicated by dotted lines, illustrating an embodiment of the present invention, with Fig. 3a illustrating the balls in an outer position and Fig. 3b illustrating the balls in an inner position after relative rotation of the cam plates;--

The paragraph beginning on page 3, line 18 is amended as indicated below.

--Figures 3a and 3b are [is an] axial views of a ball ramp actuator 20, with Fig. 3a illustrating the balls in an outer position and Fig. 3b illustrating the balls in an inner position after relative rotation of the cam plates 22, 24. The ball ramp actuator 20 comprises [comprising] two identical cam plates 22 and 24 with non-circumferential ball tracks, comprising grooves 26 and 28, facing each other, with three balls 30 therebetween[, illustrating the present invention]. As the cam plates 22 and 24 are rotated with respect to each other, the balls 30 are driven radially, while staying in the intersecting opposed ball tracks, ensuring their precise location as they move up and down the ramps of the grooves 26 and 28, without slippage.--